
ढ़लाइयों में उपयोग के लिए ज़िरकॉन रेत — विशिष्टि

(पहला पुनरीक्षण)

Zircon Sand for Use in Foundries — Specification

(First Revision)

ICS 77.020

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FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Foundry and Steel Castings Sectional Committee had been approved by the Metallurgical Engineering Division Council.

This standard was first published in 1978. This revision has been brought out to bring the standard in the latest style and format of the Indian Standards.

In addition, the following changes have been made:

- a) Reference clause is included;
- b) In **6.2**, IS 10085 is referred for chemical analysis; and
- c) Clause **10** and **12** have been modified and updated.

The composition of the Committee responsible for the formulation of this standard is given in Annex B.

For the purpose of deciding whether particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022 'Rules for rounding off numerical values (*second revision*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*Indian Standard***ZIRCON SAND FOR USE IN FOUNDRIES — SPECIFICATION***(First Revision)***1 SCOPE**

This standard covers the quality requirements for zircon sand for use in foundries.

2 REFERENCES

The standards given below contain provisions which through reference in this text, constitute provision of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent edition of these standards:

<i>IS No.</i>	<i>Title</i>
IS 460	Test sieve — Specification:
(Part 1) : 2020	Wire cloth test sieve (<i>fourth revision</i>)
(Part 2) : 2020	Perforated plate test sieve (<i>fourth revision</i>)
(Part 3) : 2020	Methods of examination of apertures of test sieves (<i>fourth revision</i>)
IS 1387 : 1993	General requirements for the supply of metallurgical materials (<i>second revision</i>)
IS 1811 : 1984	Methods of sampling foundry sand (<i>first revision</i>)
IS 1918 : 1966	Methods of physical tests for foundry sands

3 GRADES

Zircon sand for use in foundries shall be of three grades, namely, Grade 1, Grade 2 and Grade 3 based on particle distribution given in Table 1.

4 SUPPLY OF MATERIAL

General requirements relating to supply of zircon sand for use in foundries shall conform to IS 1387.

5 MANUFACTURE

The sand is obtained by processing natural beach sand deposits rich in heavy minerals.

6 CHEMICAL COMPOSITION

6.1 Zircon sand shall have the following chemical

composition on dry mass basis:

<i>Sl No.</i>	<i>Constituent</i>	<i>Percent</i>
(1)	(2)	(3)
i)	ZrO ₂	65, <i>Min</i>
ii)	SiO ₂	30 to 35
iii)	TiO ₂	0.6, <i>Max</i>
iv)	Fe ₂ O ₃	0.15, <i>Max</i>

6.2 The chemical composition of the material shall be determined either by the methods specified in IS 10085 or any other established instrumental/chemical method. In case of dispute, the procedure given in IS 10085 shall be the referee method. However, where the method is not given in IS 10085, the referee method shall be agreed to between the purchaser and the manufacturer.

7 CLAY CONTENT

The clay content of all the three grades of zircon sand, when tested in accordance with the procedure specified in IS 1918 shall be nil.

8 MOISTURE CONTENT

Moisture content of zircon sand when tested in accordance with IS 1918 shall not exceed 0.1 percent.

9 GRAIN SHAPE

Sand grain shape shall be predominantly rounded (*see* IS 1918).

10 GRAIN FINENESS

10.1 The particle size distribution of different grades of zircon sand shall conform to the requirements specified in Table 1.

10.2 The undersize and oversize values shall be valid at the point of delivery to the purchase. In the determination of ore size distribution, sieves of suitable sizes specified in IS 460 (Part 1), shall be used, wherever possible. The standard test sieve will, after period of time, become less accurate. The sieve shall, therefore, be periodically checked according to IS 460 (Part 3) and the correction factor shall be determined and applied to the result.

NOTE — Where IS Sieves are not available, other equivalent standard sieves may be used. For the purpose of comparison, the corresponding BS and ASTM test sieve numbers are given in Annex A.

11 SAMPLING

Representative samples shall be drawn according to the scheme of sampling given in IS 1811.

12 PACKING

12.1 The sand shall be supplied in appropriate gunny bags of 50 kg capacity.

12.2 The zircon sand shall be bagged in such a manner as to insure that the zircon sand is not exposed to moisture and is protected against shipping loss.

13 MARKING

13.1 The bags shall be clearly marked with the

following:

- a) Manufacturer's name;
- b) Grade designation;
- c) Quantity; and
- d) Trade-mark and grade of material.

13.2 BIS Certification Marking

The products(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provision of the *Bureau of Indian Standards Act, 2016* and the Rules and Regulations framed thereunder, and the product may be marked with the Standard Mark.

Table 1 Grain Fineness of Zircon Sand

(Clauses 3 and 10.1)

Sl No.	IS Sieve (Micron)	Grade 1 Percent, Max	Grade 2 Percent, Max	Grade 3 Percent, Max
(1)	(2)	(3)	(4)	(5)
i)	212	25	10	10
ii)	106	10	10	25
iii)	75	2	2	2

NOTE — If required, other size ranges as agreed between supplier and customer.

ANNEX A

(Clause 10.2)

COMPARATIVE SIEVE DESIGNATIONS OF IS, BS AND ASTM TEST SIEVES

Sl No.	IS Sieve, (Micron)	BS Test Sieve	ASTM Test Sieve
(1)	(2)	(3)	(4)
i)	212	72	70
ii)	106	150	140
iii)	75	200	200

ANNEX B*(Foreword)***COMMITTEE COMPOSITION**

Foundry and Steel Castings Sectional Committee, MTD 14

<i>Organization</i>	<i>Representative(s)</i>
BHEL (CFFP), Haridwar	SHRI V. K. RAIZADA(Chairperson)
Bharat Heavy Electricals Ltd, HPEP, Hyderabad	SHRI ABHINAV AGRAWAL
BHEL, Haridwar	SHRI A. N. SUDHAKAR SHRI RANJITH LAKRA (<i>Alternate</i>)
Bhilai Engineering Corporation Limited, Bhilai	SHRI AKHIL DUBEY SHRI SHIV DUTT MISHRA (<i>Alternate</i>)
CSIR - Central Mechanical Engineering Research Institute, Durgapur	DR SUDIP SAMANTHA
CSIR - National Institute for Interdisciplinary Science and Technology (NIIST), Thiruvananthapuram	DR TPD RAJAN DR M. RAVI (<i>Alternate</i>)
Directorate General of Quality Assurance, Ichhapur	SHRI ASHOK KUMAR SHRI S. ROY CHOWDHURY (<i>Alternate</i>)
Disa India Ltd, Bangalore	SHRI SUNIL KUMAR GHOSH SHRI SURESH KUMAR A (<i>Alternate</i>)
Forace Polymers Private Limited, Haridwar	SHRI D. K. GHOSH
Hindustan Aeronautics, Foundry and Forge Division, Bengaluru	SHRI K. SATYENDRA KUMAR
Indian Institute of Technology, Kharagpur	PROF SARAT PANIGRAHI PROF RAHUL MITRA (<i>Alternate</i>)
Indian Ordnance Factory Board, Kolkata	SHRI G. JHA SHRI A. K. LALA (<i>Alternate</i>)
Indian Ordnance Factory, Grey Iron Foundry, Jabalpur	SHRI M. P. YADAV SHRI ARUNANSHU PRAMANIK (<i>Alternate</i>)
Indian Register of Shipping, New Delhi	DR K. K. DHAWAN SHRI S. VELMURUGAN (<i>Alternate</i>)
Institute of Technology (BHU), Varanasi	DR INDRAJIT CHAKRABARTY DR JAYANT KUMAR SINGH (<i>Alternate</i>)
Leader Valves Ltd, Jalandhar	SHRIMATI PURNIMA BERI SHRI SARABJIT SINGH (<i>Alternate</i>)
Ministry of Defence (DGQA), Ichapur	SHRI ASHOK KUMAR SHRI RUPESH BANAIT (<i>Alternate</i>)
Ministry of Railway, RDSO, Lucknow	SHRI C. SENGUPTA SHRI RAJ KISHORE PRASAD (<i>Alternate</i>)
Ministry of Science & Technology, New Delhi	MS TAMANNA ARORA SHRI K. S. P. RAO (<i>Alternate</i>)

<i>Organization</i>	<i>Representative(s)</i>
National Institute of Foundry & Forging Technology, Ranchi	DR KAMLESH KUMAR SINGH DR AMITESH KUMAR (<i>Alternate</i>)
National Metallurgical Laboratory, Jamshedpur	DR D. N. PASWAN MS MINAL SHAH (<i>Alternate</i>)
NIT Manipur, Langol, Imphal	PROF (DR) GOUTAM SUTRADHAR DR ANIL KUMAR BIRRU (<i>Alternate I</i>) DR SABINDRA KACHHAP (<i>Alternate II</i>)
Steel Cast Ltd, Bhavnagar	SHRI V. K. MODI SHRI B. C. ROUSTRAY (<i>Alternate</i>)
Tata Motors, Jamshedpur	SHRI S. KUMAR DR D. S. PADAN (<i>Alternate</i>)
The Institute of Indian Foundry Men, New Delhi	SHRI DINESH GUPTA SHRI SANJEEV KUMAR (<i>Alternate</i>)
The Wesman Engineering Co Pvt Ltd, Kolkata	SHRI RANJAN GUHA SHRI ASHUTOSH MONDAL (<i>Alternate I</i>) SHRI PARTHA CHATTERJEE (<i>Alternate II</i>)
Versatile Equipments Pvt Ltd, Kolhapur	SHRI PUSHKRAJ JANWADKAR SHRI KIRAN PANDIT (<i>Alternate</i>)
BIS Directorate General	SHRI SANJIV MAINI, SCIENTIST 'F'/SENIOR DIRECTOR AND HEAD (METALLURGICAL ENGINEERING) [REPRESENTING DIRECTOR GENERAL (<i>Ex-officio</i>)]

Member Secretary
SHRI KUNAL KUMAR
SCIENTIST 'D'/JOINT DIRECTOR
(METALLURGICAL ENGINEERING), BIS

Bureau of Indian Standards

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Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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